MERCURY

Predictive Analytics & AI in Auditing

6 – 10 September 2027
Boston (USA)



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Ref: 16384_1018449 **Date:** 6 – 10 September 2027 **Location:** Boston (USA) **Fees:** 9500 Euro

Introduction:

Predictive Analytics & AI in Auditing explores how advanced data science techniques and artificial intelligence can transform traditional auditing from reactive checks to foresighted assurance. This course demonstrates how auditors can utilize predictive models and anomaly detection to anticipate risks, detect fraud, and enhance control optimization. You will study statistical and machine learning methods adapted to audit domains e.g., time series, classification, regression.

We also cover governance, explainability, model validation, and integration into audit workflows. The Predictive Analytics and AI in Auditing course emphasizes bridging theory and practice, enabling learners to conceptualize how predictive analytics & AI augment internal and external audit functions. Ultimately, participants will be able to design theoretical frameworks and roadmaps to integrate analytics and intelligent auditing into audit plans.

Targeted Groups:

This Predictive Analytics and AI in Auditing training targets professionals seeking specialized knowledge and skills:

- Internal auditors aiming to elevate audit assurance through analytics.
- External auditors wishing to integrate AI-driven risk assessment.
- Audit managers and directors are responsible for audit innovation.
- Risk managers and compliance officers are exploring predictive risk tools.
- Data analysts working in audit or assurance contexts.
- Consultants advising on audit transformations.

Course Objectives:

Participants will achieve the following objectives by completing the Predictive Analytics and AI in Auditing course:

- Understand the core concepts of predictive modeling, machine learning, and AI within the context of audits.
- Analyze auditing data using classification, regression, and anomaly detection techniques.
- Evaluate model performance, validation, and explainability in audit use cases.
- Design theoretical audit workflows incorporating predictive analytics for risk forecasting.
- Critically assess governance, bias, and ethical concerns in intelligent auditing.
- Formulate strategies to integrate predictive analytics into audit planning and execution.
- Communicate analytics insights and model rationale to audit stakeholders.

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Targeted Competencies:

Participants will gain the following competencies during the Predictive Analytics and AI in Auditing program:

- Ability to interpret and transform audit datasets for modeling cleaning, feature selection.
- Skill to build theoretical predictive models tailored to audit risks.
- Capability to evaluate and compare model metrics precision, recall, ROC, error.
- Competence in explaining model logic and assumptions to non-technical stakeholders.
- Aptitude to embed AI-driven checks into audit planning and control matrices.
- Sensitivity to detect and mitigate algorithmic bias or data leakage issues.
- Strategic thinking to propose analytics roadmaps for audit function modernization.

Studying Scenarios:

In this Predictive Analytics and AI in Auditing training, participants will develop their skills through the analysis of the following scenarios:

- Forecasting unusual journal entries for a hypothetical entity using time-series and anomaly detection.
- Predicting the likelihood of vendor invoice fraud using classification models based on vendor, transaction, and behavior.
- Modeling the probability of financial statement misstatement across accounts using regression and logistic approaches.
- Simulating a risk-based audit plan where predictive scores guide which cycles to audit more intensely.
- Assessing governance and ethical implications for an AI-augmented audit system in a regulated industry.
- Interpreting model outputs and explaining their rationale to a fictional audit committee.

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Course Content:

Unit 1: Foundations of Predictive Analytics & AI in Audit:

- Role of predictive analytics in shifting audit from reactive to proactive.
- Overview of regression, classification, clustering, and anomaly detection.
- Time series forecasting methods ARIMA, exponential smoothing.
- Data preparation: cleaning, transformation, feature engineering.
- Audit data sources include transaction logs, general ledger, and operational systems.
- Introduction to model explainability and interpretability.

Unit 2: Modeling Techniques for Audit Use Cases:

- Linear regression applications in analytical procedures.
- Logistic regression for binary risk classification e.g., compliance, fraud.
- Decision trees, random forests, and ensemble methods are well-suited for auditing data.
- Unsupervised techniques e.g., clustering, PCA for pattern discovery.
- Anomaly detection techniques for outlier identification.
- Cross-validation, overfitting, underfitting, and hyperparameter tuning.

Unit 3: Model Evaluation, Validation & Explainability:

- Performance metrics include accuracy, precision, recall, F1 score, and ROC/AUC.
- Confusion matrices and threshold selection.
- Validation strategies include holdout, k-fold, and bootstrap.
- Explainable AI techniques: SHAP, LIME, feature importance.
- Sensitivity analysis, robustness, stress testing.
- Identifying model bias, fairness, and audit implications.

Unit 4: Embedding Predictive Analytics into Audit Workflow:

- Risk assessment driven by model scores.
- Designing AI-augmented audit plans and sample selection.
- Control testing guided by analytics insights.
- Continuous auditing, real-time alerts, and anomaly monitoring.
- Governance, audit standards, and regulatory constraints.
- Stakeholder communication, transparency, and documentation.

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Unit 5: Advanced Topics & Future Directions:

- Integration with robotic process automation RPA in audit.
- Using neural networks and deep learning in audit contexts.
- Simulation models and scenario analysis for control design.
- Ethical, privacy, and data security considerations.
- Scalability, deployment, and maintenance of audit models.
- Roadmap for Transition to Intelligent Auditing Frameworks.

Final Insights & Key Takeaways:

This course equips participants with a conceptual and structured roadmap for embedding predictive analytics & AI into audit functions sustainably. By mastering these principles, audit professionals will anticipate risks, optimize assurance, and lead innovation in assurance processes.